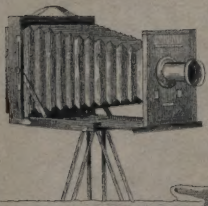

THE Amateur PHOTOGRAPHER

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THE

AMATEUR PHOTOGRAPHER

A COMPLETE GUIDE

FOR BEGINNERS

IN THE ART-SCIENCE OF

PHOTOGRAPHY

—BY—

W. F. CARLTON.

THIRTEENTH EDITION.

REVISED.

ROCHESTER, N. Y., 1895.

INTRODUCTION.

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PHOTOGRAPHY offers more attractions than any of the Arts heretofore introduced in popular form, for while it answers fully the requirements of mechanical taste, it offers constant opportunity for the exercise of higher intellectual qualities.

The simplification of Photographic processes made within the past few years, the extensive preparation, commercially, of Gelatine Dry Plates, make the successful pursuit of this most pleasing occupation, especially in its application to landscape and tourists purposes generally, within the comprehension of any person of average ability.

Amateur Photography is growing more and more in favor throughout the civilized world. Formerly, lovers of the beautiful tried to garner up the choice views of nature by sketches with the pencil. Now they save not only the outlines, but the detail as well, with the Camera.

The love of the beautiful is innate in the human mind, and this fact will make photography grow still more, for what can be more beautiful than a Photograph?

Photography is almost entirely the product of amateur effort and experiment. Experiment and investigation of phenomena, when intelligently pursued, are commendable and generally fruitful of good results, and Photography tends more than any other art to stimulate observation of both common and uncommon things and events.

It is not within the province of this book to go into abstruse demonstrations of optical, chemical or mechanical facts, but by the simplest known processes to direct beginners in the steps necessary to success, leaving to the final master of all crafts—experience—the determination of the measure of success.

The formulæ given are the simplest and best known, and are selected with especial reference to their use by amateurs.

The author does not claim originality in the formulæ or processes described; but he has experimented very largely with many formulæ and with different results, and has selected the ones given as being the simplest and giving the best results.

In conclusion, he begs to impress upon the reader's mind the imperative necessity for constant, earnest, watchful attention to all details. He has done all in his power to make Photography simple and popular; the result must remain with the amateur.

THE AUTHOR.

GENERAL OBSERVATIONS.

THE DARK ROOM.

The Dark Room is used for unpacking the Dry Plates, placing them in the Plate-Holders and for developing them after exposure.

The Dark Room does not mean a room with the door closed and light coming in the transom, or through cracks in the door, but one absolutely dark; the red light from the Ruby Lantern is the only light used.

A Special Room for a dark room is not necessary, as all the operations can be performed at night in an ordinary room, in which case the curtain should be drawn and the gas or lamp extinguished, using the Ruby Lantern only.

An Ordinary Room can be used by day by drawing the curtains and hanging some heavy opaque cloth over the entire window, so that no light enters.

A Common Dark Closet, however, is the most practicable where the amateur has no special room for the purpose, as a closet is so much more easily made dark.

Order and Cleanliness are absolutely necessary in the Dark Room. Have a convenient place for every-

thing, have everything in its place, and *never use the same bottle or dish for different purposes.* By observing these directions you will avoid a long list of failures, which would otherwise be difficult to account for.

Do not allow the Hypo to come in contact with any other solution. After using it, thoroughly wash the hands before putting them in any other solution, as, while it is perfectly harmless to handle, it will prove fatal to the other solutions. Have a place for your Hypo tray and another for your Developing tray; instead of moving the trays to the light, move the light to the trays. When not in use they should be kept in separate places, and as a further precaution it will be well, when the developing and fixing trays are similar, to mark on the under side of each the initials of the solutions used; as **D** on one and **H** on the other.

INSTRUCTIONS.

It is earnestly recommended that the beginner become thoroughly familiar with the several parts of his outfit before attempting photographic work.

If the Camera be a Tripod Instrument, set the camera in position on the Tripod, fit the Plate-Holder to the Camera, attach the lens; focus on some object and note the difference in the image on the ground-glass with the different Diaphragms in the Lens.

If it be a Hand Camera, examine the shutter, operate it a few times both for instantaneous and time exposures, fit the holders in position, and it will be well to see if the Focus Scale is correct, which you can do by focusing at different distances, and also observe the image on the View-Finder.

Dust the inside of the Plate-Holder before putting in the Dry-Plate, as dust on the Plate will make small transparent spots in the negative and consequent black spots in the finished photograph.

Fill the Ruby Lamp with astral or any good kerosene oil, and light it. Now go into your previously arranged Dark Room, *locking the door* behind you to avoid interruptions, having with you the plates and Plate-Holder.

To fill he Plate-Holder—Carefully open the sealed package of Dry Plates by cutting along the lower edge of the box to allow the removal of the cover; take a Plate by the edges, and by holding it so that the light is reflecting from the Plate to the eye, you will notice one side is bright and glossy, while the other side is more or less dull. The dull side is the *face* or film side, while the glossy or glass side is the *back*.

Place the Plates in the Holder with the *face* or dull side out, so as to be next to the slide, as this is the side which is next to the lens during the exposure and on which the impression is made.

Having placed a Plate in one side of the Holder, replace the slide and reverse the Holder, placing a Plate in the other side in a similar manner.

Having filled your holders, be sure to replace the cover on the box of Plates *before you open the door of your Dark Room.*

It is desirable to brush the face of the Plate very lightly with a Camel's Hair brush to remove any dust; be careful not to touch the face of the Plate with your fingers, as it will be liable to show the marks in the picture.

MANIPULATION OF INSTRUMENT.

Setting up the Camera—Attach the Camera firmly to the Tripod, and open ready for use; spread out the legs of the Tripod, having one leg under the front of the Camera, and the three legs nearly equal distance apart; by this means none of the legs will be at the back of the Camera, as they would be in the way of the operator.

Level the Camera; this you can do with the eye; if one side of the Camera be lower than the other, the lines of the view will not correspond to the lines of the Plate, and objects which are upright in the view will be taken diagonally on the Plate.

Ground-Glass—The Ground-Glass at the back of Camera is for focusing; the Lens forms an image on the Ground-Glass of whatever view is before it.

Focusing Cloth—To see the image on the ground glass perfectly, a Focusing Cloth is necessary to shut out all the light possible, as you cannot focus sharp if strong light strikes the ground-glass from any other direction than through the lens. The Focusing Cloth should be of some quite opaque material, the best is rubber cloth or dark velvet.

Focusing—The Camera being ready for work, cover your head and the Camera at the same time with the Focusing Cloth, and with one hand gather the ends of the cloth around the bed of Camera to exclude as much light as possible, that the image may be more distinctly seen.

Do not try to look *through* the ground glass, but *on* it, keeping your eyes eight or ten inches from the Camera.

Move the Camera-back towards you or the front frame with lens from you, whichever way the Camera may be constructed, watching the ground-glass all the time.

You will see the image of the view on the ground-glass inverted, and when the image is most distinct, you have obtained the correct focus, and should clamp the Camera at that point so that your after-manipulation will not move it.

The nearer the Camera is to the object photographed, the farther the Camera-back will need to be drawn out to get it in focus; thus it is difficult to get two objects in perfect focus at the same time, when one is near the

Camera and the other remote, though it is much improved by using a small diaphragm in the lens. The near object is said to be in the fore-ground, while the remote object is in the back-ground.

Take Time for Focusing—It will amply repay you ; it is quite evident that clear definition cannot be obtained without accurate focusing.

In focusing where instantaneous pictures are to be made with the Drop Shutter, always focus upon the point to be occupied by the coming object, and drop the Shutter when the object is in range. In Photographing *moving* objects the Drop Shutter is indispensable, but the author recommends a time exposure by the Cap, for all stationary objects.

Diaphragms or Stops—The focus having been obtained, insert the largest Diaphragm in the Lens and note the result ; you will observe that while less amount of light enters the Lens, the detail is clearer.

Remove this Diaphragm and insert a smaller one, and you will observe the picture is sharper still, but more difficult to see on account of the lessened amount of light admitted through the lens.

It is evident then that the Photograph will be sharper by using the smaller Diaphragms, but as a less amount of light is admitted, the exposure must be lengthened in proportion.

It requires a Certain amount of light to make the picture, and it is evident that it takes longer for the required amount to enter through a small than a large aperture.

In Photographing Groups or in Portraiture, it is advisable to use a large Diaphragm, which will permit of much shorter exposure, and thus avoid the blur caused by the movement of the sitters, which is liable to occur in long exposures.

The proper focus having been obtained and the Diaphragm you have decided to use is in the Lens, place the Cap on the Lens to cover it.

Now unlatch the ground-glass frame and place the Plate-Holder in position on the Camera and carefully latch it. The plate now occupies exactly the same position that the ground-glass did in focusing, and it is evident that the same view will be taken on the plate that you saw on the ground-glass. The Camera is now ready for the exposure.

Exposure—Success in obtaining a good negative depends largely upon the proper exposure of the plate, and care and judgment must, therefore, be used in this operation.

Now, everything being ready, the proper Diaphragm inserted and *cap on end of tube*, draw the slide of the holder *nearest the lens*, which is always the slide to be drawn.

Clasp the cap with the thumb and finger and draw it from the tube with a slightly spiral motion, removing it as quickly as possible and *entirely out of range of lens*, and, watch in hand, count off the seconds, replacing the cap at the end of the time allowed for the exposure; *replace the slide in the holder;* reverse the holder and expose the other plate in a similar manner.

Most people, in trying to count seconds, will count much too rapidly; the author recommends, that you practice counting seconds by holding a watch before you; this is valuable, as while you intend giving a stated number of seconds of exposure, you will not allow full time.

The different sides of your plate-holders should be numbered consecutively, with Roman capitals or figures, and exposures *always be made in the order of numbers.* Keep a memorandum book, and make notes of the length of exposure and other conditions likely to affect each plate, to which you may refer during development.

Length of Exposure—On the subject of length of exposure it is impossible to lay down any hard-and-fast rule, or to give any directions which can be blindly followed, as the variation in the power of light and in the character of the object to be photographed, form important factors which are beyond the control of the operator. Experience alone can give the needful judgment. When that is gained, a knowledge of the sensitiveness of the plate used, enables the operator to estimate his exposure with tolerable accuracy, under any conditions of light.

A few suggestions, however, will perhaps be found of use:

For a landscape view in brilliant sunlight, with smallest Diaphragm, one to five seconds will suffice, while for a dull light with sun under cloud, it will require from five to ten seconds. With the next larger Diaphragm the exposure will be about one-half as long. If very rapid plates are used, the above figures must be reduced one-half.

From eleven until two o'clock is the brightest portion of the day, the sun having more actinic power at that time. For an early morning view or late in the afternoon the exposure must be longer than at noon.

As a useful experiment, make three exposures on the same view and plate as follows: after focusing and having attached the holder to the camera, draw the slide about one-third out, and expose, giving, say one second; draw the slide one-half the remaining distance and expose again, giving the same length of time. Now draw the slide entirely from the holder and expose again, exactly as before, thus you will have three seconds for the first part of plate, two seconds for the second part and one second for the last, and the development will tell which time was nearest right.

It is perhaps unnecessary to state that every operation after focusing should be conducted with care to avoid moving the camera in the slightest degree.

HAND CAMERAS.

The foregoing Instructions are written with especial reference to Cameras using tripod, called View-Cameras or Tripod Cameras, as distinguished from Hand Cameras which are designed primarily for using in the hand for making instantaneous views.

Of course the same principle is used and the most of the foregoing will apply to a Hand Camera, but as one cannot focus while holding the Camera in the hand, this class of Camera has a Focus Scale showing where to place the lens for photographing at any distance.

This Focus Scale is made by focusing very carefully at different distances, and the proper distance marked.

As a Hand Camera is used almost wholly for instantaneous exposures, it is well to bear in mind, as mentioned previously, that a certain amount of light is required to make the impression on the plate, and when you shorten the exposure to a fraction of a second you will expect to make up for the brevity by enlarging the aperture in the diaphragm.

Do not expect to use a small diaphragm for instantaneous exposures, even in strong light, and do not attempt to make instantaneous exposures at all in very dull light.

DEVELOPMENT.

Developer—Nearly all manufacturers of Cameras and Plates have Developer put up in a concentrated form, and usually with special directions for its use.

About three ounces of Developer, when mixed, will be sufficient for a 4 x 5 plate, while four ounces will be required for a 5 x 8 plate, though if several plates are to be developed at one time, a larger quantity should be made. Prepare the developer ready for use, before closing the door of your dark room, using a graduated glass for the purpose.

Process of Development—Light the Ruby Lantern, after which you will enter and close the door of the Dark Room. Remove plate No. 1 from the Holder and place it in the Developing Tray, *face up*.

Now apply the Developer to the Plate in the Tray, taking care to cover it at one sweep; rock the Tray gently to keep the Developer moving in waves across the plate.

Now watch closely. The development of an exposed Dry Plate is a process which cannot fail to deeply interest the most careless person. As the first faint outlines appear, under the influence of the Developer, wonder grows into amazement at the change going on under one's very eyes. Outlines of familiar objects come out,

as first the mast, then the hull, then the rigging and the cords of a great vessel comes to us from out the dimness of a fog.

If there were no other compensations in Photography than the development of an exposed Plate, it would be amply sufficient to repay all the labor, care and taste required to produce it.

Duration of Development—The image should begin to appear upon a properly exposed plate in *twenty to thirty* seconds, but instantaneous exposures usually require longer, and the development should be continued until, upon examination of the plate before the light, the sky or high lights seem quite black, and the image *begins to fade* from its bright yellow appearance. At this stage the image can usually be dimly seen from the back of the plate. This operation will occupy but a few minutes, if the Plate has had full exposure, though for some instantaneous exposures it will require much longer. Do not check the development too soon, as detail will be lost and the negative will be void of contrast, but will be weak and flat ; neither continue it too long, as fog and flatness will result.

It usually requires a longer time to develop instantaneous exposures, as they are rarely fully timed, and a plate which has not had full exposure requires longer time for development.

As soon as the development is complete, the plate (it is a negative now) should be well rinsed in cold water before fixing.

FIXING.

Make a satured solution of Hypo and keep it in a bottle ready for use and label it Hypo. This should be done previous to development.

Take a quantity of the saturated solution of Hypo for a fixing bath.

Place a sufficient amount of the Fixing Bath to cover the plate in a second tray, and into this lay the negative, after development and washing; the tray should be rocked, same as when developing; allow the plate to remain in the Fixing Bath at least one minute after the opaque yellowness seen from the back has *entirely disappeared*, when it should be *thoroughly* washed in clean water.

It is perhaps unnecessary to say that the plate should always be kept *face* or *film side up*, in both the Developing and Fixing Trays.

After Fixing, the plate being no longer sensitive to light, you may go out into the light, *first being sure your remaining plates are secure from light.*

It is not necessary that the whole fixing operation should be done in the dark, but you can open the door of the dark room as soon as the plate is once in the Hypo bath, though it is best not to remove it to strong light until the fixing is nearly or quite complete.

Especial Pains should be taken to wash the negative thoroughly after fixing, so as to remove the Hypo from the film. This is best done by holding the negative under a tap of running water, but where this is not readily obtained, lay the negative in a tray of clean water and change the water many times ; at least a dozen times and two dozen will be better.

Place your negative in a negative rack until *thoroughly dried. Heat must not be used in drying.*

Develop any other plates you may have exposed, watching carefully the treatment required for the different conditions under which they were exposed.

After using the fixing bath it may be put in a separate bottle properly labeled, and can be used until it has grown a dark color, when it should be thrown away, but as it costs but little many discard it after fixing each batch of negatives.

PRINTING.

It is evident that if a piece of paper with surface made sensitive to light is placed under a negative and exposed to the light, the surface will undergo a change in exact proportion as the negative shields from or exposes it to the light. This is the principal involved in the process of Printing.

Directions for Printing—Place the Printing Frame with its springs upward on the table. Loosen the springs and take out the back-board. Lay a negative,

film side up, in the frame, and upon the negative place a piece of Sensitized paper, *face down*, being careful not to scratch the delicate film.

Now place the back-board in position, latch carefully to avoid breaking the negative. Turn the frame over and see if the paper covers the negative properly, and if any spots appear on the glass, moisten it and rub clean and bright with a cloth, as any spots on the glass will more or less mar the print.

These operations may be performed in moderate light, as the Sensitized paper is not so extremely sensitive to light as is the Dry Plate.

Examine the Prints Occasionally to see when they are printed deep enough, but do not do this in the strong light of the window, but step to one side of the window where the light is more subdued.

To Examine the Prints—Loosen one of the springs of the printing frame and raise one end of the back-board; by bending back the paper from the negative the face of the print may be seen, and if not sufficiently printed replace the back-board.

By loosening but one end of the back-board the paper will fall back into exactly the same register, after raising for examination, for it is evident it will not do to shift the paper on the negative in the slightest degree.

When the print is complete it may be placed in a dark box or drawer until a number are ready for toning; they will not change *if kept in the dark*.

As the tendency of toning and fixing is to bleach the prints, always print somewhat darker than you wish the finished Photograph to appear.

Direct or Diffused Light—Printing may be effected by the direct rays of the sun or in the shade. Printing in the shade brings out strong contrasts, while printing in the sun produces softness. A thin negative should be printed in the shade, while a dense one should be printed by direct rays of the sun.

If a negative is *very* thin and transparent, place one or more folds of white tissue paper over the front of the printing frame, thus diffusing the light thoroughly.

If, in sun printing, the whites darken before the shadows are bronzed, it is proof of a weak negative, and the recourse is to shade printing.

If, in shade printing, shadows are fully printed before detail in the high lights come, it is proof that sun printing is needed.

TRIMMING.

The prints should be neatly trimmed before toning, taking off the blank edges caused by the printing frame.

The Majority of Views are improved by trimming off a liberal margin ; especially is this true of views where some central object really comprises the picture.

The best guide for trimming is the Glass Form, as by its use you can see where to trim to best advantage.

Place the print, with face up, on a clean sheet of glass, and on the print place the glass form. Press down firmly on the form with the left hand, and with the right hand cut along each edge of the form with a sharp knife.

An ordinary pocket knife will answer, but a shoemaker's knife, which costs but a trifle, is best. The knife should be kept well sharpened.

If it is desired to trim the print smaller than usual, the glass form can be used equally well, but, of course, must be moved on the print.

WASHING BEFORE TONING.

FOR ALBUMEN PAPER.

Place the prints, one by one, face down, in a tray filled with water; they will show a strong disposition to curl up as soon as they touch the water, but as soon as they become saturated, they will be pliable.

Change the water at least four times, at intervals of from five to ten minutes; it is well to move the Prints about in the water to facilitate the washing.

Into the third washing water place a small quantity of Carbonate of Soda, which must be thoroughly dissolved before adding the Prints; about one-half ounce of soda to ten ounces of water is the correct amount.

The prints should remain in the third water, containing the soda, about ten minutes, then transfer them to the final washing water, after which they are ready for the Toning Bath.

TONING.

ALBUMEN PAPER.

There are many formulæ for Toning, and which give good results. Under this heading the author presents one of the best and simplest as being sufficient for the beginner. For those who wish to experiment more largely more formulæ are appended under the head of "Valuable Formulæ."

First—Dissolve fifteen grains of Chloride of Gold in fifteen ounces of filtered water, and label it "Gold Solution."

Second—Dissolve one ounce of Acetate of Soda in twenty ounces of filtered water, and label it "Acetate Solution."

For measuring the water use a Graduated Glass, and if it be the same one used for measuring other solutions, it must be *thoroughly* cleansed.

This Gold Solution contains one grain of gold to one ounce of water, and in the formulæ where it mentions Gold in grains, it means one ounce of above Gold Solution; there is also but a trifle over twenty grains of the Acetate of Soda to an ounce of the Acetate Solution.

One grain of gold will tone from six to eight 5 x 8 prints, when more gold must be added, and soda also.

To Prepare a Bath—Add one ounce of the Gold Solution to eight ounces of clean water, and then add one ounce of the Acetate Solution, and let it stand for five or six hours; if made the day before wanted for use, it will be even better, as a new bath does not give as even tones as an old one.

Remember this quantity will tone about six or eight 5 x 8 prints, or twice as many 4 x 5, and if you have a larger quantity to tone you must either make up a larger quantity of Toning Bath, or add more Gold and Acetate solutions after toning above quantity; the latter being the better for a beginner.

Process of Toning—From the final washing water the prints are transferred, one by one, with faces down, into the Toning Bath. If the prints are allowed to remain in the tray undisturbed, they will not tone evenly, and some spots will not tone at all; rocking the tray will aid somewhat, but to insure perfect uniformity, transfer the bottom print to the top, continuing the operation at short intervals throughout the process of toning.

The prints will soon begin to change from the reddish brown to a dark brown or purple tint. When the prints have assumed the desired tint, remove them to a tray of clean water and leave until all are toned.

From fifteen minutes to a half hour is usually sufficient time for the toning operation, though it frequently takes much longer to properly tone some prints, and some paper is more easily toned than others.

The entire process of toning may be conducted in moderate light, though it is best to be at a distance from the window, as too strong a light is apt to injure the prints.

Do not expect to get a dark tone in a print which is not printed as deep as it should be; remember, the toning and fixing tends to fade the print rather than otherwise.

Do not attempt to tone too many prints together in one dish. The prints should be placed in the solution four or five at a time, and removed when toned, when fresh prints are introduced and the process continued, keeping the prints moving to prevent irregular toning.

If the bath works too slowly it may be warmed over a fire, but should not be allowed to get hot; it is best, however, to have the bath about 70 to 90 degrees.

The prints begin to tone on the surface first, and if not toned entirely through they will turn a reddish brown in the Fixing Bath. To see whether the prints are toned through, hold them up and look at them by transmitted light; if the original red color has disappeared they are sufficiently toned.

When through toning put the toning bath in a separate bottle and label it Toning Bath. This bath should be used next time by adding the required amount of Gold and Acetate Solutions, as an old bath works better than a new one, and it has the advantage that it is ready for use as soon as the Gold and Acetate Solutions are added; no waiting is required.

FIXING.

ALBUMEN PAPER.

As soon as the prints are toned, take them from the tray of water and transfer them to the Fixing Bath, made by diluting some of the saturated solution of Hypo with four or five times its bulk of water.

Allow the prints to remain in the Fixing Bath for about fifteen minutes, agitating them the same as when in the Toning Bath.

The Fixing Bath should not be used continuously, certainly not more than two days, and it is even better to use fresh for each day's use.

WASHING.

ALBUMEN PAPER.

The prints should now be washed very thoroughly in clean water to remove every trace of Hypo.

Unless thoroughly washed out, the Hypo will cause a yellow tinge on the white portion of the picture, and finally cause the print to fade, a very vexatious and annoying occurrence, as well as an entirely unnecessary one.

The length of time required to thoroughly wash a batch of prints depends somewhat on how frequently the water is changed; the water should be changed at least a dozen times, at intervals of from fifteen minutes to a half hour.

If it is desirable to shorten the time of washing, it is better to shorten the intervals between the changes of water, than to lessen the number of changes, or constantly agitate the prints in the water.

If you should tone your prints at night, as many do, you will allow the prints to remain in the washing water until morning, when they should be rinsed in at least two or three waters.

It is recommended to use a handful of common salt in the first washing water as a preventive of blisters.

ARISTOTYPE PAPER.

The foregoing applies to Albumen Paper. Aristotype Paper is printed in same manner as Albumen Paper, but the after manipulation is somewhat different.

Albumen Paper, until the past two years was the most popular process for printing, but now, it is crowded almost entirely out by Aristotype Paper.

The name Aristotype is a very broad one and covers several brands of paper in the market, all of which are made after different formulæ and some are totally different, each maker having a distinctive name, as Peerless, Solio, Aristo, Ilo, etc.

On account of the difference noted above, it is difficult to give specific directions which will apply to all. For instance, one manufacturer advises several changes of water before toning, while another advises no washing before toning.

The manufacturers of Aristotype Paper enclose with each package specific instructions, which it will be well to follow, and these instructions are but general.

Toning—Aristotype Paper can be toned and fixed in separate baths, or it may be toned and fixed at the same time by using a combined fixing and toning bath. For the purposes of the amateur, the combined bath will be preferred.

Formulæ for making toning baths for Aristotype Paper are given by each maker, but for the ordinary amateur, who does not want to take the trouble to make these solutions, it is better to purchase it ready prepared and he will usually get better results.

Blotting Paper—Most Aristotype Papers are made from gelatine, and when wet the surface is sticky. Blotting paper will stick to it if used to absorb the moisture after mounting, as is advised for Albumen Paper.

Glacé Finish—If you do not want to mount Aristotype prints, a very high polish may be given them by laying them face down on a sheet of Ferrotype plate and rub lightly until it lays perfectly flat against the plate. When perfectly dry the print can be removed, when it will have a high glacé finish.

A Mat Surface may be obtained by substituting a sheet of ground-glass for the Ferrotype plate.

MOUNTING.

After the prints are washed they are ready for mounting on card board, or as usually called, Card-Mounts; this operation is very simple.

Remove the prints from the water one by one, drain off all surplus water, and place in a pile, with faces down, on a clean sheet of glass.

Apply a thin coat of paste to the back of upper print, using a Bristle brush for the purpose; place the print carefully on the card-mount, working from the center to the

ends so as to be free from air bubbles. Place a sheet of paper over the print to prevent it from becoming rubbed or torn, and rub the paper with the palm of the hand until the print lies perfectly smooth.

If the prints are not required to be mounted at once on leaving the water, they should be dried, and when mounted subsequently they should be thrown into clean water until they lie flat, and then mount as usual. Do not try to mount them while dry.

One of the best articles for making prints lie smooth is a small roller similar to a paper-hanger's roller, and which any amateur can make for himself. Cover the roller with velveteen and pass the roller over the paper which covers the print.

When Aristotype Paper is made from gelatine the surface is soft when wet, so that paper will adhere to it, in which case a sheet of rubber cloth is best to cover the print before rubbing it down on the card-mount.

GENERAL NOTES.

Two very common errors made by beginners are *over-exposure* and *under-development.*

Over-exposure—When a plate has been much over-exposed the image will appear at once on applying the developer, though without any very distinct outlines, and it will disappear again almost immediately ; such a negative will be lacking in contrast and the prints from it will be without distinct lights and shades.

When the image flashes into view at once, showing over-exposure, a small pinch of Bromide Ammonia added to the developer will restrain its action and may save the negative; adding water to the developer will also retard its action.

If you anticipate that a plate has been over-exposed, commence development with a very weak developer and with less than normal quantity of the alkali, by which is meant Potash, Soda or Ammonia, whichever is used with Pyro, Hydrochinon or Eikonogen, as a developing agent.

Under-exposure—When a plate has not had sufficient exposure, the image will appear very slowly, the bright portions of the view appearing much before the darker portion and with strong contrasts; such a negative will be very vigorous, but will be lacking in detail.

For an under-exposed plate you will increase the quantity of the alkali solution to gain detail in the shadows.

Where a plate has not had full exposure, and detail in the shadows comes very slowly, a very acceptable negative may sometimes be obtained by diluting the developer with three or four times its bulk of water and allowing the plate to remain in this for some time; even as long as one or two hours in a *very* weak developer has been known to make a very good negative from a plate which, developed in the ordinary way, would have been worthless

INTENSIFICATION.

When a negative is weak, flat or lacking in vigor, it is frequently much benefitted by intensifying, in which case proceed as follows;

Take sufficient amount of Intensifier to cover the plate in a dish *used only for that purpose.* Then place the plate in the solution, taking care that the surface is entirely covered as quickly as possible. As soon as the film has attained an olive color, take the plate out for examination, and if the film appears to be changed from the smoky black to a yellowish olive color, wash the plate *very thoroughly*, and place it on the rack to dry. When thoroughly dry make a proof by printing from it, and compare with previous proof; if sufficient intensity is not obtained, repeat the operation.

Intensification may take place either at once after fixing and washing, or at any subsequent time, at the pleasure of the operator.

The Intensifier must he thoroughly washed from the film, otherwise the image will entirely disappear in time.

Intensifier may be made by the formula given under the head of "Valuable Formulæ," or can usually be purchased in a concentrated form of the dealer of whom you buy other accessories.

VARNISHING.

Varnishing a negative is generally unnecessary and is only done for the sake of protecting the face of the negative from scratching, which may occur from careless handling, but when you are satisfied that a negative possesses sufficient merit to warrant its preservation, dust carefully when thoroughly day, and hold before a fire until

quite warm ; balance the negative on the ends of the fingers of the left hand, face up, and pour a small amount of the varnish on the face of the negative and flow it to each corner ; avoid haste and do not go over the same portions of the plate twice ; afterwards make the plate quite hot and keep at that temperature for some time to harden the film, holding it horizontally and gently rocking to and fro, to prevent the varnish from drying in lines or ridges.

FUMING.

Fuming Sensitized Albumen Paper with Ammonia before printing is earnestly recommended. The advantages derived from this process are important. It increases the brilliancy of the prints, and it also increases the sensitive qualities of the paper, the printing is more rapidly done ; the toning is rendered easier and also it has a strong tendency to prevent blisters.

Fuming, however, destroys the keeping qualities of the paper, hence you should fume only for immediate use.

To make a good fuming box, procure a wooden box with a cover, the box to be at least six inches deep and as much deeper as may be convenient. Cut two pieces of board about three inches wide and as long as the inside of the box ; to the edges of these cleats nail small strips of wood, about one-half inch apart, the length of the strips being the same as the width of the box ; this makes a rack that will fit in the box and is supported about three inches from the bottom.

Place a saucer containing some Stronger Water of Ammonia on the bottom of the box, put in the rack, and on it lay the sensitized paper.

From fifteen minutes to a half hour is the time required to properly fume sensitized paper; remove the paper from the fuming box at least five minutes before placing in the printing frame.

OTHER PRINTING PROCESSES.

Though the methods previously described, that of printing on albumen paper sensitized with silver, and Aristotype paper, which is a gelatine or other surface sensitized with silver, are the most common in use, yet there are several other processes, some of which are designed for especial uses, while others are designed as rivals of the older and still popular processes. The author mentions only such of the many processes as are best adapted for amateur's use.

BLUE-PRINT PROCESS.

This process is well adapted for amateurs for making proofs from negatives, or if a print is desired quickly, as it requires no toning, merely washing after printing.

In using Ferro-Prussiate or blue paper, place the face or dark-colored side of the paper against the negative in the printing frame and expose the negative to direct sunlight; instead of turning a bronze color, as does the sensitized albumen paper, this paper will turn a rich blue.

When sufficiently printed, which can be told by examination, immerse the print in a tray of clean water; the parts which have turned blue are permanent, while the rest will wash off, leaving a beautiful permanent blue and white picture.

The soluble portion will wash off immediately on immersion in the water, but the print will be much clearer if allowed to remain in the water for fifteen or twenty minutes, then rinse again in clean water and place between blotters to dry.

BROMIDE PAPER.

This process has proven quite popular for certain uses; it certainly has the advantage of enabling one to produce a large number of prints in a short time, and the ability to print on this paper by artificial light is an advantage.

This paper is extremely sensitive and must be handled in the dark room only; the paper is laid on the negative in the printing frame with face down, same as for any other paper, but the exposure is very brief, ranging from one to five seconds by diffused day-light, or ten to twenty seconds at a distance of one foot from an oil lamp.

The image printed on this paper is not visible until developed similar to a Dry Plate.

The author will not give detailed instructions regarding the manipulation of Bromide paper, as very explicit instructions are furnished by the manufacturers of this paper with each package.

TRANSPARENCIES.

A Transparency is a photograph on glass, and is indeed a most beautiful production, preserving more clearly the delicate lines of the negative than any other method of printing.

A Transparency is made on a Dry Plate by printing in a similar manner to Bromide paper.

Especial Dry Plates for transparencies are made by several plate makers, these plates being much slower working than those designed for use in the camera, as a slow plate makes a more brilliant transparency than a rapid one.

Lay a negative in the printing frame, same as for paper printing, and on this lay an unexposed Dry Plate, the film of each being in contact.

The exposure must be by artificial light, for should you use daylight there is danger of over-exposure.

The length of exposure varies according to the negative, but with a medium negative the exposure will be approximately from five to ten seconds at two feet distant from a gas jet, or one foot from an oil lamp. Lighted matches are excellent for giving exposure ; two or three lighted at once and held about a foot from the negative, until they are consumed, will usually give plenty of exposure.

After exposure the plate is developed in the same manner as though exposed in the camera, the Hydrochinon or Ferrous-Oxalate developer being preferred to Pyro ; if Pyro developer is used the plate should be immersed in an alum bath to clear it of the Pyro stain.

Transparencies are beautiful for window decorations and as lantern-slides ; if to be used for a window transparency it should be placed in a frame with ground-glass at the back for a mat. If used for a lantern, a piece of clear glass should be placed at the back and sealed together by means of a border of black needle paper.

VIGNETTING.

Sometimes, especially in portraiture, it is desirable to print only from the center of the negative, leaving out the edges, and yet blend the printing so as to give an artistic effect by softening the print into a white border ; a print made in this manner is termed a vignette ; the negative is made in the usual manner, the difference being made in printing.

To vignette a photograph you will need a vignetter of some kind, either one made expressly for the purpose or an improvised one ; a good vignetter is made by making a frame of thin wood about two inches deep, with a top in which is an opening nearly as large as the negative ; this frame (or it might be called a shallow box) should be made so it will fit snugly over the printing frame.

Take a piece of card-board large enough to more than cover the opening in the vignetter, and in the card-board cut an aperture of the size and shape required, oval, pear-shaped, etc., the pear-shaped being most used for portraiture, the narrow portion being placed over the head, the wide portion over the shoulders ; around the edges of the

opening in the card-board cut slots about one inch deep and one-eighth inch apart, and turn the points upward ; one or more thicknesses of tissue paper should be pasted over the aperture in the card-board to diffuse the light.

Place the negative and sheet of sensitized paper in the printing frame as for ordinary printing ; place the vignetter over the printing frame and the light entering through the aperture in the card-board vignetter will print the shape of the aperture ; as a certain amount of light will enter through the interstices around the edge of the aperture, caused by cutting the slots, the edges of the print are not abrupt.

The lines of a vignette are softened by using more thicknesses of tissue paper or by raising the vignetter farther above the negative, while by using but one thickness of tissue paper and strong light, or by placing the vignetter close above the negative, the lines are made more abrupt.

CUT OUTS.

Take a piece of non-actinic paper (thick paper of any very deep color will usually work well) of the same size as the negative, in which cut any desired size and shape of aperture ; place this between the negative and sheet of sensitized paper in the printing frame ; the print will be the exact size and shape of the aperture, the border being quite white.

A very pretty effect is also produced by taking a piece of non-actinic paper, and cut it to any size and shape

required; place this between the sensitized paper and a plain piece of glass, instead of the negative, in the printing frame; place the frame in the sun and print until the edges of the paper are a very dark brown, after which remove it and print with this paper as usual, the effect being the same as the cut-out, except with brown border instead of white.

Hints on Landscape Photography.

As landscapes are always seen with disadvantage under a noon-day sun, so photographs taken under similar circumstances are most unpleasing; and as photography tends to exaggerate contrasts of light and shade, the result is all the worse. Many experienced photographers, therefore, avoid taking views when the sun shines most brilliant, but choose rather the morning, or days when the sky is covered with white clouds, through which the sun's rays occasionally break.

As the camera has not the painter's power of excluding or subduing intrusive objects, all the photographer can do is to endeavor to select his point of view, so as to avoid them. This is a matter demanding the utmost pains and care, for after the view has been taken, it will sometimes be found that a change of position of even a few rods would have made a material improvement, a discovery both mortifying and annoying, and better avoided by a careful search beforehand.

The point of sight from which to take the picture will be regulated by circumstances, but sometimes circumstances can be made to bend to your will and give you your choice. The novice cannot tell just how a certain view will look on his screen; he will shift to the right, to the left, move higher or lower, until he knows what to expect, or how he stands relative to light and shade and perspective. But all this is good, refining, and assists in future, as it is his first lesson in arranging his composition.

The whole scene in many landscapes changes by standing a little higher or lower, or a few paces to the right or left. The man having the eye of an artist, who knows how to seek the best position, will at all times give the best picture.

When a particular scene has first struck the fancy, and if, upon closer investigation it be found that the chosen position does not give harmony, then, by some slight change of the point of view, other combinations may come into operation which may satisfy the taste.

The foreground really constitutes the picture, and should be given due prominence on the plate, middistance and distance are insufficient of themselves to form a pleasing picture, but, made accessory to, and combined with the foreground, the result will be an artistic whole, which will be most pleasing to the eye.

In every picture there are certain points that are more prominent than the others, and to which other parts are made more or less subordinate; none of these points

should occupy the exact center of the picture, especially if there be one object of more importance than all the rest, as a tree for instance; if the most important object, and it be placed in the center, it will divide the picture into exact halves; while the same object if placed either way from the center, will look much more artistic.

There is great beauty in very trifling objects, which many overlook. Bushes and vines, rocks, stones, logs, often have elements of attraction that reveal themselves only by observation and cultivation. An artificial arrangement of such objects in the foreground of a photograph lends to it an inexpressible charm.

Never be satisfied with "good enough." One first-class view is worth a dozen indifferent ones. Superficial observers entertain the belief that landscape photographs must be as good as others, as the object remains always the same, and all are prepared by the same process. Nothing can be more erroneous. The object is not always the same, for a landscape appears under very different aspects in the morning and evening light, or in different states of the weather. Whoever studies these effects of light will soon discover at what hour a certain view will look most beautiful and will choose that time for taking his view. Accordingly, his picture will surpass greatly that of a hasty or superficial person who takes the view as he finds it.

An agreeable division of the foreground is a capital point in a landscape. Almost any characteristic

and prominent object will have a good effect, logs, stones, and still more, rocks, bushes; anything that breaks the level and changes the lines also attracts and pleases the eye—not in itself, but in the general character that it imparts. It may generally be affirmed that scarcely anything can so much detract from the effect of a landscape as an unbroken foreground, level in form and uniform in light. Such a foreground will mar, if not destroy, the effect of the finest object. The artistic photographer will always change his position to avoid such a foreground, or if he is tied down to a particular spot from some imperative cause, he will, if possible, have some object thrown where it will support his lines.

Many commonplace scenes require only the proper lighting, and perhaps the introduction of a proper figure in the right place to make it a beautiful subject for the camera. The commonplace is always attractive when well treated. Simple subjects appeal to everybody.

Many landscapes are much improved by the introduction of living objects, to give expression and interest to the view, care being taken that they are so placed that they are made accessory to the scene.

Frequently human figures are introduced with good effect, but they are not advantageous unless used to make up the story, when they must be so placed and posed that they harmonize with the balance of the picture and become one of the parts that make up the whole.

In composing a scene where figures are introduced, it is bad taste to represent the figures as looking at the camera ; this is a very common mistake among beginners, and naturally, as the camera being the central point of interest, all persons in sight, unless cautioned by the photographer, just previous to the exposure will invariably gaze at the instrument ; in many cases the effect is better if the figures are placed with the side or back to the camera. Let us suppose for instance that we are looking at a perfect piece of scenery, a figure in the foreground leaning against a tree and contemplating the scene, apparently unconscious of the photographer's presence, will have a better effect than if presented as facing the camera, and watching the operations of the photographer.

In combining figures with a landscape view, appropriateness must be observed, and this is a fine test of one's artistic powers, and is an excellent school in art composition. Figures which are not appropriately dressed, appropriately occupied, appropriately placed, might with much better taste, be left out of the scene entirely.

INSTANTANEOUS PHOTOGRAPHY.

When objects in motion are to be photographed, it is apparent the exposure must be exceedingly brief, that the movement shall be inappreciable.

To these exposures the term "instantaneous" is applied. As it is apparent that the cap cannot be removed and replaced quick enough, it becomes necessary to use a mechanical contrivance for exposing the plate. For this purpose it is necessary to use the "drop shutter" which reduces the exposure to a very small fraction of a second.

When the exposure is so exceedingly brief as in this case, it is evident that a very large diaphragm is required to admit the necessary amount of light in so short a time.

Moving objects, such as animals in motion, yachts on the river, or railroad trains, may be taken with the "drop shutter," and the results will appear as if they were standing still.

Instantaneous Photography possesses a fascination peculiar to itself; the amateur feels a peculiar desire to take "something," and if that "something" be an animate object, unconscious of his presence so much the better, and with what a thrill does he see his first "snap shot" develop up, whether a railroad train, trotting horse, or a man hurrying along the street, whom he has transfixed with one foot on the ground, the other in the air, and his whole figure in an attitude that the original would repudiate, and declare he never assumed such a position, were the proof not against him.

Instantaneous photography has become especially popular since the introduction of Hand Cameras, as this style of camera is peculiarly adapted to "snap shots" Many Amateurs who possess a tripod Camera also possess a

small Hand Camera for their instantaneous work, for one will many times take a Hand Camera with him when he would not take a regular Tripod Camera.

FLASH LIGHTS.

Magnesium powder, for producing a brilliant artificial light for photographing, is now attracting wide attention; this very properly comes under the head of Instantaneous Photography.

There are many preparations in the market for producing the flash, all of which are based on explosives mixed with the Magnesium powder to ignite it.

Pure Magnesium powder is the best however, as there is a minimum of smoke and a pure, white quality of light. This powder must be ignited in a flame, usually by forcing a quantity of the powder through the flame.

In photographing with the Magnesium flash powder you will need to focus by the aid of what light you can get from the gas jet or lamps, and when the focus has been obtained apply the holder and cap the lens. When all is ready, draw the slide, uncap the lens and make the flash, and cap the lens immediately after.

If portraits are taken by flash light, it is advisable to have the room as brilliantly lighted as possible, as the brilliant flash is more apparent in a darkened room, and is more apt to cause the sitter to close his eyes at the moment of exposure.

In photographing a group, or in taking a portrait by flash light, it is best that none be looking directly at the flash, for the eyes do not close involuntarily, they are apt to have a strained appearance, best described as "staring."

A large sheet of tissue paper held between the light and the sitter will soften the effect, though this is not always desirable.

Care should be taken that the light is so placed as not to shine in the lens; it is well usually to place the light a little to one side of and above the camera.

The development of the plate is about the same as for any instantaneous exposure.

PORTRAITURE AND GROUPS.

The exceeding nearness of the object, the difficulty of obtaining proper illumination and appropriate surroundings, together with other obstacles, both optical and mechanical, render portraiture more difficult of accomplishment than landscape photography.

The greatest ingenuity has been applied to produce the requisite effects, the accessories of a first-class studio being far beyond the reach of the ordinary amateur.

Because the amateur has no well appointed studio, with skylight and other accessories of the professional photographer, there is no reason why he cannot make most excellent portraits, if he has good judgment and a desire to improve.

The best light for home portraiture is usually derived on a porch or on a lawn in the shadow of a house or tree; do not try to take portraits in a broad open light, as you cannot expect to get any fine gradation of light and shade, the contrasts will be too strong, besides the fact that the picture will not have a natural look, as it is impossible to keep one's eyes open fully, facing a strong light.

Good portraits may be taken in an ordinary room well lighted, but the exposure must be very many times longer than for outside work, as the light of the brightest room without a skylight is much weaker than out of doors.

To obtain the best possible results, the amateur must make up, as far as possible, the lack of a skylight, and will have some kind of screens to control the light as best he can.

The best time of day for out-door portraiture is either early in the forenoon or quite late in the afternoon, as the light is more easily controlled than when the sun's rays are nearly vertical.

If, in out-door portraiture, it be desirable to represent an interior view, a rug spread upon the ground, chairs from the house, together with a Japanese screen for a back-ground, will have the desired effect.

Be careful in posing the sitter, to get the best illumination possible, and to know just how to derive the most harmonious distribution of light and shade. You must carefully study the subject, and you will soon become able to tell at a glance which will be the best pose under the circumstances.

Do not trust to the appearance of the sitter as seen by the eye, but examine carefully the appearance of the image on the ground-glass, and you can tell much better whether the pose is good, and also whether the distribution of the light is harmonious.

For indoor portraiture the room best suited to the purpose is one on an upper floor and on the east or south side of the house, so as to get the best light. The sitter should be about two feet from the window and about the same distance to one side of it, this being the best position for light, the camera being on the opposite side of the window. The shade of the window should be raised as high as possible, and if the light be partially obscured from the lower half of the window, by hanging up some semi-opaque material, the direction of the light will be nearer that of a skylight; this will lessen the volume of light and will necessitate a longer exposure.

Direct sunlight must not fall on the sitter; if sunlight comes through the window, hang up some thin white cloth at the window to soften the light.

A screen will be necessary to reflect light back to the sitter to softly illuminate the shadow side of the face; the screen will be about three or four feet from the sitter.

In posing a sitter, keep the chin well up and the head perfectly straight on the shoulders. The eyes should follow the direction of the face and avoid all fancy positions.

Three-quarter or full faces are preferable; for a full face the body should be turned slightly toward the light, while for a three-quarter face the body should be square with the camera, as the effect is not so stiff as if the head were square with the body.

Look to the hands in posing; do not have them crossed or held in front of the sitter, especially when making a large figure, as they will appear abnormally large; this is not so apparent when the camera is farther removed from the sitter for a smaller figure, and not noticed at all in groups where all the figures are smaller.

When arranging groups for portraiture, consider first the appropriate size of figures with relation to the plate you are working and the space to be occupied by the group; do not try to have the group occupy too large a proportion of the plate, as the result is not so agreeable.

Look well to the margin, for it will add beauty to the picture to have a margin; besides, when a group occupies the full size of the plate, the figures near the edge will not have a clear and sharp picture.

Do not stand the members of a group in a direct row, as it looks stiff and unnatural; allow them to assume natural and unconstrained positions.

Do not scatter the figures widely apart; give the foremost place to the smallest members, with the larger members in the rear. Give some attention to arranging the group according to the dress of individuals, so as not to have too strong contrasts of dress.

For occasional portraits of friends, no back-ground will be necessary; indeed, many will prefer the walls of their own room or porch, as the case may be; in many instances, however, the walls may not be of the best color for the purpose, and if much portraiture is to be done, especially out-door portraiture, a back-ground is recommended, no matter how simple it may be.

A light colored cloth on a frame, or a large sheet of paper held back of the sitter, makes a good back-ground for a portrait in the house. Some one should hold it and constantly *move* it during the exposure, so as to make a plain back-ground; of course the one holding it should be *back* of it.

Plain linoleum, of a light color, makes a good back-ground. You can graduate the tint by using the back-ground placed obliquely to the lens, or by the use of a curtain to *shade* it gradually so as to get a similar effect.

Place the subject so that the shadow side will be against the light part of the back-ground and *vice versa*. The shade should be increased or diminished according to the complexion of the subject.

A good Background for amateur purposes may be made by making a wooden frame of suitable size, and on one side of this frame stretch and tack some kind of cloth of a light shade, and on the other side stretch a similar cloth of a darker shade, and you can use either, according to the color of the sitter's dress. Two short sticks nailed across the bottom of the frame will answer for the base.

In open-air groups a white table-cloth will reflect light on faces and give soft shadows.

Make a screen for graduating the light; one that can easily be taken apart and rolled up can be made by taking two sticks about five feet long, nail a short piece across one end of each for a base, use these as uprights and take two more pieces somewhat shorter for cross-pieces; these should be joined at the corners by small hooks or by wooden pins. Attach the cloth (common sheeting) to this frame by means of small hooks.

INTERIORS.

Next to portraiture, interiors are most difficult to photograph, owing to deep shadows and lack of light. Any room is dark in comparison with the broad and free light of outside.

The length of exposure varies greatly, as some rooms are much darker than others, sometimes requiring ten, fifteen or even as much as twenty *minutes*, when half as many *seconds* outside would suffice.

In photographing interiors do not point the camera *towards* the light but *from* it. Place the camera so as to avoid including a window if possible, as owing to the greater amount of light coming from the window than from the rest, it will be much over-exposed before the rest of the picture has had exposure enough. When it is not possible to avoid including a window in the picture or it be desirable to include it, a good picture can be obtained as follows:

After Focusing and all is ready for exposure close the blinds and draw the curtain of the windows, and get as much light as possible from side windows or doors. All being ready, expose for the required length of time, five, ten or twenty minutes, as the case may be, and cap the lens carefully, to avoid moving the camera. Now raise the curtains and open the blinds, and expose again for, say from three to five *seconds.* This is a double exposure and will be found to give good detail on the window which would otherwise be lost from over-exposure.

It is very difficult indeed to avoid strong contrasts in interiors, owing to the great difference in the light in different parts of a room.

When the difference in the amount of light in the several parts of a room is excessive, it is a good idea to close the shutters, making the room darker but with less contrast; you will then lengthen the exposure accordingly; this is not practicable in a room which is in constant use, as the exposure may require several hours.

STEREOSCOPIC VIEWS.

Stereoscopic views are two separate pictures on one plate, made by two lenses placed side by side on the camera, with a division inside the camera between the lenses; the distance between the lenses is supposed to correspond to the distance between the human eyes, though the effect is better if they are placed farther apart, the usual distance being about three and one-half inches; the foci of the two

lenses must correspond exactly so both halves of the plate will be in perfect focus.

In taking stereoscopic pictures the exposure of the two lenses must be simultaneous and of the same duration, so both halves of the plate will have the same length of exposure, and will be of the same density after development, that both halves may print alike; the latter is essential, and if one-half of the plate should print quicker than the other, place one or more thicknesses of tissue paper over it.

The other operations are the same as for single pictures, except mounting the prints; in mounting they must be cut apart and placed on the card mount reversed, that is the print on the right must be placed on the left side of mount and the print on the left will be on the right side of mount; this brings the outer edges of the print together.

In trimming stereoscopic pictures, care should be taken to trim from both sides alike, so as to preserve the center; otherwise the stereoscopic effect is destroyed.

Stereoscopic prints are usually trimmed to about three or three and one-quarter inches wide, and from three and one-half to four inches high, with oval or square top.

PHOTOGRAPHING MACHINERY.

Usually when a piece of machinery of any kind whatever is ready to leave the manufacturer's hands, or fitted

up at its final destination, it is in the worst possible state to be photographed.

The glossy paint, usually of the most non-actinic colors, renders a strong contrast between light and shade, and will not give a smooth effect; and if the machine be one embracing raw castings, the effect will be very objectionable.

When a manufacturer desires a photograph of a piece of machinery, it is usually to show the capabilities of his establishment, or to enable him to obtain further orders for the same or similar goods; in either case it is to promote his business, and when necessary, the slight preparation of the machine for being photographed will more than pay.

Especially if painted a dark color, the machine should be specially painted; the paint to employ should be a simple mixture of black and white, to about what would be called a pale slate color; it should not be ordinary oil color, but something of the kind called "flatting" by painters.

White lead darkened with lamp-black and made up with turpentine, with the smallest amount of oil possible, or japanner's gold size may be used as flatting. It should be borne in mind that the more matt or dead the paint dries the better it will hide any inequality in the surface of any large mass. In cases where the machine is set up ready for work it may be impracticable to use above paint, when a temporary paint may be made by mixing

whiting and lamp-black with beer, adding a little ox-gall, or by mixing the whiting and lamp-black with alcohol and adding a little shellac to make it stay; either of these paints can be readily mopped off.

With regard to focusing the image, the operator will frequently find difficulty in finding a proper stand-point; either there is scarcely sufficient space to retire far enough from the object, or it is too high; therefore, for large machinery in a small room a wide angle lens will be most suitable, and a camera having a rising front and both vertical and horizontal swings.

A slight observation will generally enable the operator to notice any important part that receives less light than another; the use of a reflector made of white paper will improve definition at that point, and sometimes a sheet of paper may be placed behind any aperture to show its outlines more clearly, if the back-ground should be dark.

Avoid, if possible, a stand-point that will give a window as a back-ground, and expose for the darkest parts, allowing the better lighted portions to care for themselves.

In photographing machinery, which has not been specially painted, the outline will be better if a light back-ground be used if the machine be dark, and a dark back-ground if the machine be light.

A FEW GENERAL HINTS.

See that all solutions are properly labeled.

Keep all solutions in bottle, well stoppered.

Lenses should always be kept carefully protected.

Keep plates in a cool, dry place, to prevent them from spoiling.

A quill pen makes a capital lifter for the plate during development.

A rubber stopper is preferable to one of cork, especially for ammonia.

Do not allow the camera or lens to remain in the sun when not in use.

Provide yourself with an extra ground-glass when going a long distance.

Prefer over-exposure to under-exposure, providing you can restrain your developer.

Keep ready sensitized paper in a box or drawer, away from light, and in a *perfectly dry place.*

In any view, expose for the darker parts of the view, leaving the better lighted portions to care for themselves.

If the glass stopper of a bottle be slightly smeared with vaseline, it will not stick to the bottle, and the latter is more nearly air-tight.

Occasionally wipe out the inside of the camera with a cloth, to remove dust which, by settling on the plate, will cause pin-holes.

To make clean work, dust off the plate with a camel's hair brush, after placing them in the holder; also dust out the holder frequently.

Before starting on a photographing tour, carefully look over your apparatus and see that everything is in perfect order and that nothing is missing.

If a plate be wet with clean water before the application of the developer, it will cause the developer to flow more readily and evenly over the surface.

In packing bottles for transportation, as may sometimes be required for a long trip, heavy rubber bands placed around them will prevent breakage.

In photographing in dimly lighted interiors, it is sometimes desirable to render the ground-glass more transparent. A very slight coat of glycerine on the ground surface will have the desired effect.

Exercise care to locate the image perfectly straight on the ground-glass; parallel vertical lines drawn on the ground-glass about one-inch apart will aid in this; some amateurs draw both vertical and horizontal lines.

Where an amateur uses smaller plates in his holders than his camera is designed for, it is an excellent idea to mark on the center of the ground-glass the shape and size of the plate; this will be an aid to him in making the size of the image correspond to the size of the plate.

The amateur should change as little as possible; select the plates of some good maker, and if you succeed with them stick to them and not go chopping and changing about. The same rule will also hold good with chemicals.

To produce the effect of a snowstorm, make a thin solution of Indian ink and water, dip a small stiff brush in this solution and spatter on the negative, taking care that the spray strikes the negative at the proper angle to give the effect of snow falling; do not hold the brush too close to the negative, as the spray is finer and is distributed more evenly if held at a distance.

When not in use the lens should always be kept covered with its cap. If dusty, clean the glass with some old soft linen or chamois leather, but *never with cotton or silk*. Ignorance of this fact has ruined many a fine lens. The flange or collar of the lens tube is fastened to the front part, or the front board of the camera, and the tube containing the lens either screws or slides into this collar. It is generally removed when the camera is packed up, rolled in tissue paper, and if small, placed inside the body of the camera for safe keeping and carriage. Some cameras are made with the front board reversible, which places the lens inside of the camera when packed, and will not jar or rattle; this is a convenience.

When an amateur is on an extended trip and wishes to reserve the development of his plates until his return, one of the best receptacles for the exposed plate is their original box; the transfer from the holder to the box and *vice versa*, may be effected in an ordinary room at night, by drawing the curtains and making the room as dark as possible. In placing them in the box, take the two plates from the first holder and place them face to face with a piece of white tissue paper between the films,

around these wrap a piece of paper (orange colored paper is the best, as it is to quite an extent non-actinic), and write on each side the nature of the view, length of exposure, etc., of the plate; place them in the box and treat those in the second holder in a similar manner. When the box is filled, cover and wrap in paper, and write on it the word "exposed."

VALUABLE FORMULÆ.

CARLTON'S PYRO-POTASH DEVELOPER.

No. 1.	Pyrogallic Acid,	1 ounce.
	Sulphite of Soda,	3 "
	Bromide Ammonia,	20 grains.
	Citric Acid,	60 "
	Sulphurous Acid,	1 ounce.
	Water,	12 "
No. 2.	Carbonate of Potash,	4 ounces.
	Water,	12 "

Two drams each of Nos. 1 and 2 added to four ounces of water makes a normal developer. A properly exposed plate will develop readily with normal developer; for an under-exposed plate use an excess of No. 2; for an over-exposed plate use less of No. 2 or add more water.

CARLTON'S HYDROCHINON DEVELOPER.

A	Hydrochinon,	½ ounce.
	Sulphite of Soda,	2½ "
	Meta-bisulphite of Potash,	¼ "
	Water,	32 "
B	Carbonate of Potash,	3 "
	Water,	32 "

Equal parts of A and B make a normal developer for properly exposed plates; for an over-exposed plate use less of B, or add more water; for an under-exposed plate use more of B. After mixing a given quantity it can be used over and over until exhausted, though it should be kept in a separate bottle well corked.

This developer will work slower for each succeeding plate, hence an old developer is excellent for an over-exposed plate.

HYDROCHINON DEVELOPER.

In One Solution.

Hydrochinon,	¼ ounce.
Sulphite of Soda,	1½ "
Meta-bisulphite of Potash,	¼ "
Carbonate of Potash,	1 "
Water,	32 "

For over-exposed plates add more water or use an old developer.

In using Hydrochinon developer it is an excellent plan to have two mixed solutions, a fresh one for plates which have proper exposure, and an old one for over-exposed plates. If you think the plate may be over-exposed commence with the old solution, and if development proceeds slowly, transfer the plate to the new solution.

EIKONOGEN DEVELOPER.

No. 1.

Sulphite of Soda,	4 ounces.
Eikonogen,	1 "
Glycerine,	2 "
Water,	60 "

No. 2.	Carbonate of Soda, - -	2 ounces.
	Carbonate of Potash, - - -	2 "
	Water, - - - - -	20 "

Use three ounces of No. 1 to one ounce of No. 2 for a normal developer for landscape work where plate has had full exposure.

For very short instantaneous exposures use the formula below or you can use it to strengthen the above developer for short exposures.

Eikonogen developer can be used over and over but of course must be kept in a separate bottle and well corked.

EIKONOGEN DEVELOPER.

In One Solution.

Sulphite of Soda, - - -	4 ounces.
Eikonogen, - - - - -	1 "
Glycerine, - - - - -	2 "
Carbonate of Potash, - - -	1 "
Carbonate of Soda, - - -	1 "
Water, - - - - -	36 "

For plates which have had full exposure use this developer diluted with about equal quantity of water. Strengthen from the stock solution as required.

After using this developer, put in separate bottle, and it can be used over and over again.

To dissolve Eikonogen, place it in an earthen bowl with the Sulphite of Soda and a portion of the water, and place the bowl in water and bring it to boiling point.

If the Eikonogen be finely powdered by means of a mortar and pestle, it will dissolve without heat by shaking.

Eikonogen developer does not, as a rule, give as dense negatives as other developers.

If more density is required, transfer the plate to a tray containing water at about 70 degrees, after the detail is well out, and allow to soak for from three to five minutes.

SELECTED TONING FORMULÆ.

FOR ALBUMEN PAPER.

No. 1. For Purple and Black Tones.

Chloride of Gold,	1 grain.
Bi-carbonate of Soda,	4 to 8 grains.
Water,	8 ounces.

This bath should be made an hour before use, and does not keep well, so must be used at once. For purple tones use the smaller quantity of bi-carbonate; for black, the larger quantity.

No. 2. For Sepia, Brown or Purple Tones.

Chloride of Gold,	1 grain.
Saturated Solution of Borax,	1 ounce.
Water,	7 ounces.

This is ready for use soon after mixing.

No. 3. For deep Brown, Purple or Black Tones.

Chloride of Gold,	1 grain.
Tungstate of Soda,	20 grains.
Distilled Water (boiling),	8 ounces

Dissolve the Tungstate of Soda in two ounces of the water, to which add the Chloride of Gold; after five minutes add the remainder of the water.

No. 4. For Deep Brown Tones.

Chloride of Gold,	1 grain.
Acetate of Soda,	20 grains.
Water,	8 ounces.

This bath keeps well and is better for being made several hours before use.

TO TONE BLUE PRINTS PURPLE OR GREEN-BLACK.

Borax,	1 ounce.
Water,	14 ounces.

Add Sulphuric Acid in small quantities until blue litmus paper is turned slightly red, then add a few drops of Ammonia until red litmus paper is turned blue; then add to the solution 60 grains Catechu and allow it to dissolve with occasional stirring.

To tone a print, immerse it in this bath until the desired tone is obtained, which will be from five to ten minutes. Wash thoroughly. This bath keeps well.

Blue Prints may be changed to a brown color by the following method. After washing and drying, immerse the print in the following solution:

Stronger Water of Ammonia,	1 ounce.
Water,	8 ounces.

Allow the print to remain in this solution until it has nearly or quite lost its blue color, which will take from two to five minutes, when it should be rinsed and immersed in the following solution:

Tannic Acid,	1 dram.
Water,	6 ounces.

Dissolve and filter. The print is to be removed from this bath as soon as the desired sharpness and tone are obtained. This last operation will occupy from ten to fifteen minutes. If the color is not dark enough at the expiration of this time, it is intensified by adding a few drops of ammonia, and allow the print to remain one or two minutes longer and then rinse freely.

PASTE FOR MOUNTING.

Starch, one ounce; water, eight ounces. Mix and heat over boiling water until turned, then add one-half ounce of glycerine. The paste so prepared keeps well in the warmest weather for about ten days, and in winter an indefinite time.

ANOTHER.

Arrowroot,	3 drams.
Water,	3 ounces.
Gelatine,	15 grains.

Dissolve the gelatine in the water first, then add the arrowroot, and boil. When cool add two drams of alcohol and a few drops of carbolic acid.

MOUNTING SOLUTION.

For Scrap Books, Etc.

Nelson's Photographic Gelatine,	2 ounces.
Water,	8 ounces.
Glycerine,	½ ounce.
Alcohol,	3 ounces.

Dissolve the gelatine in the water, then add the glycerine and then the alcohol.

TO KEEP UNMOUNTED ALBUMEN PRINTS FROM ROLLING UP.

Glycerine,	3 ounces.
Alcohol,	4 ounces.
Water,	1 ounce.

Draw the print over the edge of tray to remove the surplus and dry between blotters under a light weight.

NEGATIVE VARNISH.

Sandarac,	2 ounces.
Alcohol,	14 ounces.
Oil of Lavender,	1½ ounces.
Chloroform,	2 drams.

INTENSIFIER.

Bi-chloride of Mercury,	60 grains	No. 1.
Water,	6 ounces	
Iodide Potassium,	90 grains	No. 2.
Water,	2 ounces	
Hypo,	120 grains	No. 3.
Water,	2 ounces	

When the bi-chloride of mercury is dissolved, pour No. 2 into No. 1, and the solution will assume a scarlet color. Shake well and add No. 3, which will clear the solution, making it again transparent.

EXPLANATIONS.

Explanations of words, phrases and abbreviations used in photography which might not be understood by the beginner:

SATURATED SOLUTION—When any solid chemical is added to a liquid, the liquid will dissolve a certain amount of it. When it has dissolved all that it will, the solution thus formed is called a saturated solution. This can easily be told, as the portion not dissolved will remain in the bottom of the solution and refuse to become dissolved except by the addition of more liquid.

PYRO—Means pyrogallic acid.

HYPO—Means Hypo-sulphite of soda.